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PATENT

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claims 1-17 (Cancelled)

Claim 18 (New) An integrated circuit comprising:

a voltage controlled oscillator comprising:

a first gm cell;

a second gm cell having a noninverting input coupled to a noninverting output of the first gm cell, an inverting input coupled to an inverting input of the first gm cell, a noninverting output coupled to an inverting input of the first gm cell, and an inverting output coupled to a noninverting input of the first gm cell;

a first capacitance coupled between the noninverting output and inverting output of the first gm cell;

a second capacitance coupled between the noninverting output and inverting output of the second gm cell; and

a variable resistance coupled between the noninverting output and inverting output of the first gm cell, wherein the variable resistance comprises a native MOS device.

Claim 19 (New) The integrated circuit of claim 18 wherein the variable resistance comprises a plurality of native MOS devices coupled in series.

Claim 20 (New) The integrated circuit of claim 18 wherein the variable resistance comprises two native MOS devices coupled in series.

Claim 21 (New) The integrated circuit of claim 18 wherein a gate of the native MOS device is configured to receive a control voltage.

Claim 22 (New) The integrated circuit of claim 21 further comprising:

a phase/frequency detector having an input coupled to the voltage controlled oscillator; and

a charge pump coupled between the phase/frequency detector and the voltage controlled oscillator.

Claim 23 (New) The integrated circuit of claim 22 further comprising a loop filter coupled to an output of the charge pump,

wherein the loop filter is configured to provide a control voltage to the voltage controlled oscillator.

Claim 24 (New) The integrated circuit of claim 23 wherein the control voltage is used to tune a filter.

Claim 25 (New) The integrated circuit of claim 24 wherein the filter is a low pass filter.

Claim 26 (New) A method of tuning a filter comprising:.

receiving a reference clock signal having a first frequency;

receiving a signal from a voltage controlled oscillator having a second frequency;

comparing the first frequency to the second frequency;

providing a charging signal to a loop filter, the charging signal based on the comparison between the first frequency and the second frequency; and

adjusting the second frequency by:

receiving an output signal from the loop filter; and

using the output signal from the loop filter to adjust a first variable resistance,

the first variable resistance between a noninverting and inverting output of a gm cell, and the first variable resistance comprising a native MOS device.

Claim 27 (New) The method of claim 26 further comprising:

receiving the output signal from the loop filter with a second filter;

using the output signal from the loop filter to adjust a second variable resistance,

the second variable resistance between a noninverting and inverting output of a gm cell, the second variable resistance comprising a native MOS device,

wherein a value of the second variable resistance determines a frequency characteristic of the second filter.

Claim 28 (New) The method of claim 27 wherein the second filter is a low pass filter.

Claim 29 (New) The method of claim 28 wherein the frequency characteristic of the second filter is a cutoff frequency of the second filter.

Claim 30 (New) The integrated circuit of claim 29 wherein the variable resistance comprises a plurality of native MOS devices coupled in series.

Claim 31 (New) The integrated circuit of claim 29 wherein the variable resistance comprises two native MOS devices coupled in series.

Claim 32 (New) An integrated circuit comprising:

a phase-locked loop configured to tune a filter and comprising:

a phase/frequency detector having a first input, and a second input configured to receive a reference clock;

a charge pump coupled to an output of the phase/frequency detector; and

a voltage controlled oscillator having an control voltage input coupled to an output of the charge pump and an output coupled to the first input of the phase/frequency detector, the voltage controlled oscillator comprising:

a first gm cell;

a second gm cell having a noninverting input coupled to a noninverting output of the first gm cell, an inverting input coupled to an inverting input of the first gm cell, a noninverting output coupled to an inverting input of the first gm cell, and an inverting output coupled to a noninverting input of the first gm cell;

a first capacitance coupled between the noninverting and inverting outputs of the first gm cell;

a second capacitance coupled between the noninverting and inverting outputs of the second gm cell; and

a variable resistance coupled between the noninverting output and inverting output of the first gm cell, wherein the variable resistance comprises a native MOS device; and

a first filter having a control voltage input coupled to the output of the charge pump.

Claim 33 (New) The integrated circuit of claim 32 wherein the phase-locked loop further comprises a loop filter configured to filter the output of the charge pump.

Claim 34 (New) The integrated circuit of claim 32 wherein the variable resistance comprises a plurality of native MOS devices coupled in series.

Claim 35 (New) The integrated circuit of claim 32 wherein the variable resistance comprises two native MOS devices coupled in series.

Claim 36 (New) The integrated circuit of claim 35 wherein a gate of the native MOS devices are configured to receive the output of the charge pump.

Claim 37 (New) The method of claim 36 wherein the first filter is a low pass filter.